

**SECTION 905(B) (WRDA 86) ANALYSIS
GULF INTRACOASTAL WATERWAY, TEXAS
PORT O'CONNOR-CORPUS CHRISTI BAY**

1. STUDY AUTHORITY

This study is authorized by Section 216 of the 1970 Flood Control Act, which reads:

"The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significant changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest."

The District received \$100,000 in Fiscal Year 1997 to conduct the reconnaissance phase.

2. STUDY PURPOSE

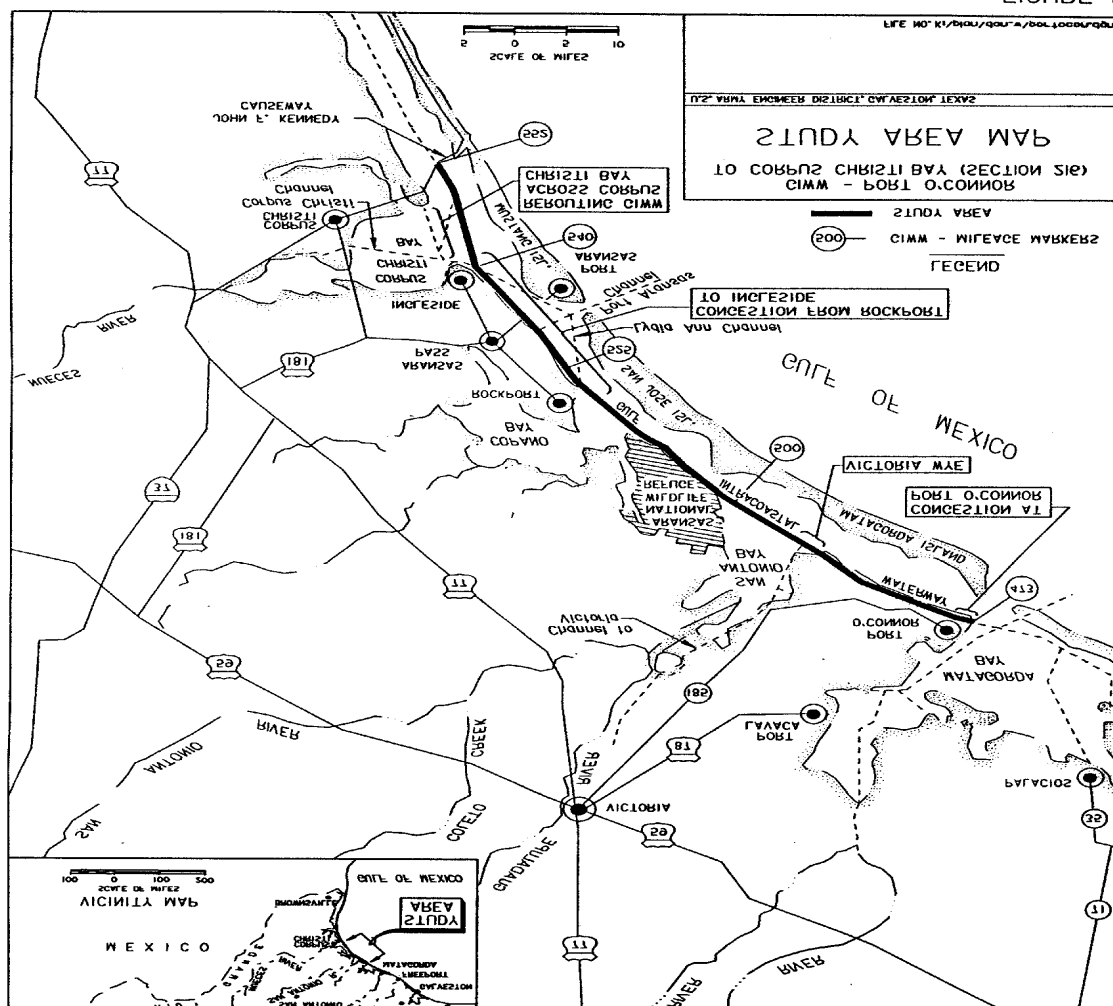
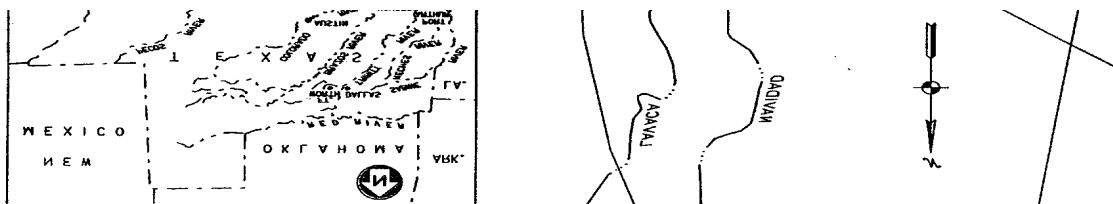
The purpose of this study is to determine the need for Federal navigation improvements for the portion of the Gulf Intracoastal Waterway (GIWW) between Port O'Connor, Texas and the John F. Kennedy Causeway in Corpus Christi, Texas. The study will also investigate opportunities for ecosystem restoration, including beneficial use of dredged material.

3. LOCATION OF PROJECT/CONGRESSIONAL DISTRICT

The study area is along the GIWW from (see Figure 1) Port O'Connor, Texas westward to the Kennedy Causeway, at Corpus Christi, Texas, a distance of 79 miles.

The study area is located in the jurisdiction of the following legislators:

US Senator Phil Gramm (R)
US Senator Kay Bailey Hutchison (R)
US Representative, 14th District - Ron Paul (R)
US Representative, 15th District - Ruben Hinojosa (D)
US Representative, 27th District - Solomon Ortiz (D)



4. DISCUSSION OF PRIOR STUDIES, REPORTS AND EXISTING WATER PROJECTS

A Section 216 report was completed for the entire Texas section of the GIWW in November 1989. The report was a general appraisal of operational and other problems for the 423-mile waterway in Texas. The report identified two critical areas requiring immediate attention and provided an assessment and plan for addressing the remainder of the waterway in five segments. The two critical areas were at Sargent Beach and the Aransas National Wildlife Refuge (ANWR). The Sargent Beach segment, located about 55 miles east of Port O'Connor, was being threatened with breaching caused by Gulf shoreline erosion rates exceeding 25 feet per year. This area has since been authorized for construction of an 8-mile revetment, and the construction is scheduled for completion late in 1997.

The other critical area was located within the limits of this study reach, in the vicinity of the ANWR, the wintering grounds of the rare and endangered whooping crane. Channel bank erosion caused from navigation traffic traversing the GIWW and natural wind and currents were causing losses of whooping crane habitat. A feasibility study was conducted and recommended a project consisting of 14.3 miles of bank stabilization and spill containment control features. The project was authorized for construction by the Water Resources Development Act of 1996.

Other projects within the study reach are the tributary Channel to Victoria, Channel to Aransas Pass, and the deep draft Corpus Christi Ship Channel. The Channel to Victoria project, which also serves the port of Seadrift, is presently undergoing modification to match the 12-foot by 125-foot dimensions of the GIWW. The 14-foot deep by 125-foot wide Aransas Pass Channel intersects the GIWW at channel mile 533 and serves offshore fishing interests and offshore supply boats. At approximately channel mile 539, the GIWW crosses the 45-foot deep by 400-foot wide Corpus Christi Ship Channel project near the town of Ingleside.

5. PLAN FORMULATION

A systematic approach will be applied to the study area during Feasibility phase. Such an approach will allow prioritization of problems to determine the most efficient solution. This eliminates the consideration of problems that have little overall effect on the throughput of traffic within the system. For example, eliminating or reducing a delay at one location may cause the problem to be transferred to another location, but not actually realizing a time-saving.

The 423-mile Texas section of the GIWW serves as an important element in the economy of Texas, moving commerce between the major ports of Texas and other ports along the Gulf Coast and up the interior Mississippi River system. In 1995, approximately 70 million tons of commerce was moved on the GIWW through Texas ports. Also in 1995, over 5,000 tow trips moved approximately 24 million tons of cargo through the study reach, with the vast majority of tow trips terminating in Corpus Christi. Only about 2 million tons pass through the GIWW west of the Corpus Christi Ship Channel.

In addition to high commercial navigation traffic activity, the area contains long stretches of estuarine environments that are sensitive to impacts from navigation traffic and the necessary placement of material from channel maintenance activities. An assessment of placement area future needs and potential beneficial uses of dredged material will be addressed in a separately funded and coordinated DMMP. Deep draft navigation traffic entering and exiting the Port of Corpus Christi as well as US Navy warships from the Ingleside Navy Base cross the GIWW within this area and may affect barge and other shallow draft traffic. There is an increasing concentration of other recreational and commercial boat traffic that contributes to congestion in navigating the GIWW as well as contributing to other impacts along the waterway.

Projections indicate that there will be a steady growth of shallow draft commerce in the study area. During the period from 1980 through 1995, annual movements through the study reach increased at an annual rate of 2

percent per year. The ratio of study reach tonnage to total GIWW tonnage for the period 1980-95 is 22 percent. This ratio has remained relatively constant over the 15-year period, ranging from a high of 25 percent in 1981 to a low of 21 percent in 1991. A linear regression analysis incorporating study reach tonnage, total GIWW tonnage, and the Institute for Water Resources' 1992 Inland Waterway Review 1992-2010 forecast suggests that study reach tonnage should increase at an annual rate ranging from 2 percent to 4 percent over the next 15-year period. Any time-delay problems currently being experienced along the waterway can be expected to become more acute in the future as a result of increased tonnages and associated traffic increases.

a. Identified Problems

Through various public involvement activities, four problem areas have been identified thus far within this reach of the GIWW that are contributing to inefficiencies in the movement of commerce. These problems are, from east to west:

- (1) Congestion at mooring facilities in the Port O'Connor area which forces slow tow movement and prevents full utilization of existing navigational facilities.
- (2) Groundings and inefficient use of the wye intersection at the Channel to Victoria.
- (3) Congestion from Rockport to Ingleside, including the intersection of the GIWW with the Corpus Christi ship channel, which forces slow tow movement along this stretch. This congestion prevents the movement of empty barges and multiple-barge tows, forcing these tows to utilize the longer route of the Lydia Ann Channel.
- (4) A high shoaling rate at mile 542, just west of the Corpus Christi Ship Channel, forces most tow operators to use a more preferable route to the north across unmarked waters of Corpus Christi Bay.

b. Evaluation of Alternatives

The array of alternatives to be examined in the feasibility study includes structural and non-structural improvements to this portion of the GIWW. For each of the problem areas identified, alternative combinations of actions, including no action, will be examined for economic feasibility of proposed solutions. In some instances there may be no economically feasible solution, but there needs to be a technical examination of the situation in order to make a determination.

- (1) Congestion in the Port O'Connor area: A no action alternative would continue the existing delay of tows and exposure of development along the channel to an accident. This lack of maneuvering room resulted in tow operators requesting the removal of four of 14 mooring buoys in order to reduce the risk of an accident with a restaurant whose dining patio juts into the GIWW. This leaves only 10 buoys to accommodate tripping across Matagorda Bay for the increasing tow traffic. The predominant cargo of these tows is feedstock and products found to and from petro-chemical facilities along the Gulf Coast. Many of these cargoes are hazardous materials. A collision between tows, or between a tow and a shore-side structure, would involve possible loss of life as well as extensive property and environmental damage. Such a spill would threaten marsh areas located near Port O'Connor that are utilized by wintering whooping cranes. The most likely alternative is to relocate the mooring buoys, presently situated across the GIWW from the Port O'Connor business district, to another location on the GIWW two or three miles to the west. A mooring basin 100 feet wide and about 4,000 feet long would be constructed. At this new location, barges could moor and maneuver without fear of colliding with other vessels, a commercial dock, or residences. The estimated costs for economic evaluation include a first cost of \$700,000 and an annual maintenance cost of \$14,000.
- (2) Channel to Victoria wye: The Channel to Victoria project intersects the GIWW at a right angle at channel mile 492. The present configuration is a wye design, consisting of two relatively narrow, high curvature radius channels. Tow operators have indicated a preference for a flared intersection for

reasons of safety and reduction of delays. Many times, multiple barge tows cannot negotiate these narrow, sharply curving channels. Many operators will reconfigure their load, although this takes time, rather than risk running aground in the shallow area of the wye. The most likely alternative as requested by the waterway users is to construct a 200-foot wide turning area or basin at the intersection and abandon the wye's. The estimated costs for economic evaluation include a first cost of \$63,000 and an annual maintenance cost of \$6,000.

(3) GIWW from Rockport, to Ingleside, Texas: This area is narrow and congested, forcing operators to reduce speed. Large rocks used in bank riprap pose a hazard to barges. Part of the channel bottom is reported to consist of solid rock. Thus, any grounding presents the possibility of a fuel or hazardous material spill and would create a potential threat to property and the environment. Because of these potential dangers, most tow companies use the Lydia Ann Channel, which involves considerable extra distance. The increased activity and dredging associated with the establishment of the new Navy facility at Ingleside adds to navigation difficulties. The most likely alternative that would reduce delays is widening the channel for greater tolerances and safety. However, non-structural traffic control alternatives will also need to be considered. Since the nature of the problem is not yet well defined, an alternative for economic evaluation can not be selected. However, a conservative estimate of \$3,000,000 in first cost for improvements was used for further evaluation. The annual maintenance cost increase attributable to a project was estimated as 10% of the current annual maintenance cost for this reach or \$10,000.

(4) Rerouting approximately 7 miles of the GIWW across Corpus Christi Bay: The alignment of the GIWW, just west of the Corpus Christi Ship Channel at Mile 542, cuts through an island created by dredged material. The GIWW channel at this point continually shoals with sand eroding from this placement area. The channel is often narrow and shallow through this cut, and most tow captains go north to open water, then head southwest across the unmarked Corpus Christi Bay. Although not included in the benefit analysis, this route would be less expensive to create and maintain because very little, if any, dredging would be required. The most likely alternative for this problem would be abandonment of the GIWW in its current location and rerouting across the deeper water of Corpus Christi Bay. Minimal additional dredging is expected to be required. The estimated first cost is \$15,000 with negligible maintenance.

6. FEDERAL INTEREST

a. Economic Indicators.

With a systematic approach, full project benefits can be realized only if measures are implemented at several locations or combinations thereof. Without an optimization analysis, an individual benefit calculation at each problem location would have undetermined impact on the overall benefits to throughput traffic. An analysis at a specific location could show an unfavorable benefit-to-cost ratio while its inclusion in the system analysis could show favorable. An optimization analysis is beyond the scope of a reconnaissance study, however, for the purposes of this report it was assumed that potential time savings are cumulative. The estimated average annual benefits which can be attained through cumulative time savings is \$879,000. This was calculated based on interviews with waterway users and applying data from "Waterborne Commerce Statistics, 1995". The estimated first cost for the most likely modifications at all locations would be \$3,778,000 with an average annual cost over a 50-year period of \$309,000. This yields a prefatory benefit-to-cost ratio of 2.8.

b. Environmental impacts.

Although there are environmental issues that will have to be addressed, preliminary analysis indicated that there are no major environmental impacts associated with the problems identified. The risk of discovering any previously unknown HTRW sites in the area is considered low. Magnetometer surveys will be required to

assure that no previously undiscovered underwater historical sites will be affected. There are many threatened and endangered species in the study area, but no impacts are expected. Alternatives will be fully covered under the Endangered Species Act and coordinated with the U.S. Fish and Wildlife Service and other appropriate agencies. The Texas Coastal Zone Management Plan will require additional documentation and coordination to insure that any alternative selected is consistent with that plan. Any action will be appropriately covered with NEPA and CEQ documents as required, prior to that action taking place. Water and sediment quality is not likely to present a problem. However, a water quality certificate for any action will be included in the appropriate NEPA document. There are opportunities for the beneficial use of materials removed from the Victoria wye. There may be needs for additional placement areas depending upon alternative selection for the Rockport to Ingleside reach, which may also present an opportunity for beneficial uses.

In conclusion, It is considered highly likely that the identification of an economically feasible, environmentally acceptable project will result from feasibility investigations.

7. PRELIMINARY FINANCIAL ANALYSIS

For typical navigation studies, the feasibility phase is cost-shared equally between a non-Federal sponsor and the Federal government. However, the Inland Waterways Revenue Act of 1978 (Public Law 95-02) designated the main channel of the Texas section of the GIWW as part of the nation's inland waterway system. Through subsequent Public Laws, these designated waterways have been exempted from non-Federal cost sharing of studies. Therefore, no letter of intent from a local sponsor to cost share is required. Construction activities which may result from this study would be cost shared with the Inland Waterway Trust Fund and the General Treasury.

8. RECOMMENDATION

On the basis of the findings above, I recommend that this Reconnaissance Study be certified as being in accordance with current policy and that a feasibility study be conducted. The estimated feasibility study cost is \$3.8 million over a three-year period. A Project Study Plan is currently being developed.

9. POTENTIAL ISSUES AFFECTING INITIATION OF FEASIBILITY PHASE

None

CHRISTOPHER L. BRESLEY
MAJ, EN
Acting Commander